11/085253

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended): [[-]] A method for localizing one or more sources, ~~said source or sources~~ being in motion relative to a network of sensors the method comprising the following steps:

~~a step for the separation~~ separating [[of]] the sources in order to identify the direction vectors associated with the response of the sensors to a source at a given incidence ; ~~, the method comprising at least the following steps :~~

[[°]] associating the direction vectors $a_{1p(1)m} \ldots a_{Kp(K)m}$ obtained for the m^{th} transmitter and, respectively, for the instants $t_1 \ldots t_K$ and for the wavelengths $\lambda_{p(1)} \ldots\ldots, \lambda_{p(k)}$, and

[[°]] localizing the m^{th} transmitter from the components of the vectors $a_{1p(1)m} \ldots a_{Kp(K)m}$ measured with different wavelengths.

2. [[-]](currently amended): [[A]] The method according to claim 1 wherein, in considering that, for each pair, $(t_k, \lambda_{p(k)})$, M_k vectors $a_{kp(k)j}$ $(1<j<M_k)$ have been identified, the step of association for K pairs $(t_k, \lambda_{p(k)})$ comprises ~~at least~~ the following steps :

[[AS1]] 1) [[R]]resetting of the process at k=0, m=1 and M=1 and, for all the triplets $(t_k, \lambda_{p(k)}, j)$, resetting a flag of association with a transmitter $flag_{kj}$ at $flag_{kj}=0$;

[[AS2]] 2) [[S]]searching for an index j and a pair $(t_k, \lambda_{p(k)})$ such that the flag, $flag_{kj}=0$;

[[AS3]] 3) [[F]]for this 1^{st} triplet $(t_k, \lambda_{p(k)}, j)$ obtained at the step 2, effecting $flag_{kj}=1$ and resetting a test flag of association with the transmitter of this triplet $link_{k'i}=0$

for $k' \neq k$ and $i' \neq j$ and $i\dot{n}d_m = \{k\}$ and $\Phi_m = \{ \mathbf{a}_{kp(k)j} \}$;

[[AS4]] 4) [[D]]determining the pair $(t_{k'}, \lambda_{p(k')})$ minimizing the distance $\mathbf{d}_{kk}$ with $(t_k, \lambda_{p(k)})$ such that $k \in ind_m$ in the time-frequency space and in which there exists at least one vector $\mathbf{b}_i = \mathbf{a}_{k'p(k')i}$ such that $flag_{k'i}=0$ and $link_{k'i}=0$;

[[AS5]] 5) [[I]]in using the relationship (4) defined here above, determining the index $i(m)$ that minimizes the difference between the vectors $\mathbf{a}_{kp(k)m}$ such that $k \in ind_m$ and the vectors $\mathbf{b}_i$ identified with the instant-wavelength pairs $(t_{k'}, \lambda_{p(k')})$ for $(1 \leq i \leq M_{k'})$ and $flag_{k'i}=0$ and $link_{k'i}=0$;

[[AS6]] 6) [[D]]doing $link_{k'i(m)}=1$: the test of association has been performed ;

[[AS7]] 7) [[I]]if $d(\mathbf{a}_{kp(k)m}, \mathbf{b}_{i(m)}) \leq \eta$ and $| t_k - t_{k'} | < \Delta t_{max}$ then: $\Phi_m = \{ \Phi_m \; \mathbf{b}_{i(m)} \}$, $ind_m = \{ ind_m \; k' \}$, $flag_{k' i(m)}=1$;

[[AS8]] 8) [[I]]if there is at least one doublet $(t_{k'}, \lambda_{p(k')})$ and one index i such that $link_{k'i}=0$, then repeating the steps from the step 4 ;

[[AS9]] 9) defining the family of vectors $\Phi_m = \{\mathbf{a}_{1p(1)m} \ldots \mathbf{a}_{K(m),p(K(m)),m} \}$ associated with the source indexed by m in writing $K(m)=cardinal(\Phi_m)$; and

[[AS10]] 10) [[F]]from the family of vectors $\Phi_m = \{\mathbf{a}_{1p(1),m} \ldots \mathbf{a}_{K(M),p(K(M)),m} \}$, extracting the J instants $t_i \in ind_J \subset ind_m$ which correspond to aberrant points located outside a defined zone.

[[AS11]] 11) [[R]]returning to the step [[AS3]] 3) if there is at least one triplet $(t_k, \lambda_{p(k)}, j)$ such that $flag_{kj}=0$.

3 [[-]] (currently amended): [[A]] The method according to claim 1 wherein the localizing step comprises ~~at least~~ the following steps :

maximizing a criterion of standardized vector correlation $L_K(x,y,z)$ in the position

space (x,y,z) of a transmitter with

$$L_K(x,y,z)=\frac{\left|\mathbf{b}_K{}^H\mathbf{v}_K(x,y,z)\right|^2}{\left(\mathbf{b}_K{}^H\mathbf{b}_K\right)\left(\mathbf{v}_K(x,y,z)^H\mathbf{v}_K(x,y,z)\right)}$$

with

$$\mathbf{b}_K=\begin{bmatrix}\mathbf{b}_{1m}\\ \vdots\\ \mathbf{b}_{Km}\end{bmatrix}=\mathbf{v}_K(x_m,y_m,z_m)+\mathbf{w}_K\ ,\ \mathbf{v}_K(x,y,z)=\begin{bmatrix}\mathbf{b}(t_1,\lambda_{p(1)},x,y,z)\\ \vdots\\ \mathbf{b}(t_K,\lambda_{p(K)},x,y,z)\end{bmatrix}\ \text{and}$$

$$\mathbf{w}_K=\begin{bmatrix}\mathbf{w}_{1m}\\ \vdots\\ \mathbf{w}_{Km}\end{bmatrix}$$

where $\mathbf{w}_k$ is the noise vector for all the positions (x, y, z) of a transmitter.

4 [[-]] (currently amended): [[A]] The method according to claim 3 , wherein the vector $\mathbf{b}_K$ comprises a noise-representing vector whose components are functions of the components of the vectors $\mathbf{a}_{1m} \ldots \mathbf{a}_{Km}$.

5 [[-]] (currently amended): A method according to claim 3, comprising a step in which the matrix of covariance $\mathbf{R}=E[\mathbf{w}_K\,\mathbf{w}_K{}^H]$ of the noise vector is determined, and wherein the following criterion is maximized

$$L_K'(x,y,z)=\frac{\left|\mathbf{b}_K{}^H\,\mathbf{R}^{-1}\,\mathbf{v}_K(x,y,z)\right|^2}{\left(\mathbf{b}_K{}^H\mathbf{R}^{-1}\mathbf{b}_K\right)\left(\mathbf{v}_K(x,y,z)^H\mathbf{R}^{-1}\mathbf{v}_K(x,y,z)\right)}$$

6 [[-]] (currently amended): [[A]] The method according to claim 5 , wherein the assessment of the criterion $L_K(x,y,z)$ and/or the criterion $L_K'(x,y,z)$ is recursive.

7 [[-]](currently amended): [[A]] The method according to ~~one of the~~ claim[[s]] 1, ~~to 6~~ comprising a step to compare the maximum values with a threshold value.

8 [[-]](currently amended): [[A]] The method according to ~~one of the~~ claim[[s]] 1, ~~to 7~~ wherein the transmitters to be localized are mobile and wherein the vector considered is parametrized by the position of the transmitter to be localized and the speed vector.

9. (new): The method according to claim 2, comprising a step to compare the maximum values with a threshold value.

10. (new): The method according to claim 3, comprising a step to compare the maximum values with a threshold value.

11. (new): The method according to claim 4, comprising a step to compare the maximum values with a threshold value.

12. (new): The method according to claim 5, comprising a step to compare the maximum values with a threshold value.

13. (new): The method according to claim 6, comprising a step to compare the maximum values with a threshold value.

14. (new): The method according to claim 2, wherein the transmitters to be localized are mobile and wherein the vector considered is parametrized by the position of the transmitter to be localized and the speed vector.

15. (new): The method according to claim 3, wherein the transmitters to be localized are mobile and wherein the vector considered is parametrized by the position of the transmitter to be localized and the speed vector.

16. (new): The method according to claim 4, wherein the transmitters to be localized are mobile and wherein the vector considered is parametrized by the position of the transmitter to be localized and the speed vector.

17. (new): The method according to claim 5, wherein the transmitters to be localized are mobile and wherein the vector considered is parametrized by the position of the transmitter to be localized and the speed vector.

18. (new): The method according to claim 6, wherein the transmitters to be localized are mobile and wherein the vector considered is parametrized by the position of the transmitter to be localized and the speed vector.

19. (new): The method according to claim 7, wherein the transmitters to be localized are mobile and wherein the vector considered is parametrized by the position of the transmitter to be localized and the speed vector.